ASSET/LIABILITY MANAGEMENT IN KANSAS BANKS

By

Christine A. Cole

and

Allen M. Featherstone*

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*The authors are associate extension agricultural economist and professor, Department of
Agricultural Economics, Kansas State University.

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ABSTRACT

A survey of 441 Kansas banks was used to document the asset/liability management techniques used in commercial banks. Results indicate gap analysis, diversification, and specialized asset/liability management computer software are the major risk management techniques used; derivative products are seldom used. Results suggest no clear consensus on the software used.

ASSET/LIABILITY MANAGEMENT IN KANSAS BANKS

Asset/liability management (ALM) is the act of planning, acquiring, and directing the flow of funds through a financial organization to generate adequate and stable earnings, maintain adequate liquidity, and steadily build capital, while taking reasonable and measured business risks. In short, ALM is the sum of the financial risk management of any financial institution. This includes setting policy, structuring of loan repricing and maturity schedules, undertaking financial hedge positions, budgeting capital, and measuring internal profitability. Asset/liability management also involves contingency planning and the analysis of the impacts of unexpected changes in interest rates, competition, and economic growth. Uyemura and Van Deventer state that ALM also is concerned with understanding how individual business decisions and aggregate portfolio composition affect a bank's overall risk profile and how the bank should risk-adjust its performance.

Because ALM is such a critical part of any financial institution's operations and its risk management, it is imperative that banks recognize ALM's importance and employ effective risk management procedures. Without the use of successful ALM techniques, banks are insufficiently protected from ever-changing financial risks and consequently find their profitability jeopardized, as did many banks in the late 1970s and early 1980s.

Asset/liability management is a bank-specific control mechanism. Several banks may employ similar ALM techniques, or each bank may use a unique system. The purpose of this paper is to examine the asset/liability management techniques used in Kansas commercial banks. A survey of all Kansas banks investigated the various ALM techniques currently utilized.

SURVEY DESIGN

The survey was mailed to the CEO of 441 Kansas banks. This broad survey allowed the study to capture the existing diversity in Kansas banks. The survey was conducted during the fall of 1995. The questionnaire consisted of four areas: bank characteristics, identifying risk, risk responses, and ALM. The bank characteristics section focused on such factors as bank size, location, ownership, and charter. Such components are useful for classifying and comparing banks. The identifying risk section dealt with bankers' perceptions of risk factors and their importance. The section of risk responses was concerned with various risk management tools and their use. The final section ascertained the use of specific ALM techniques and models employed by the bank.

EMPIRICAL SURVEY RESULTS

The final survey response rate was 26.5%. One-hundred seventeen usable responses were received from the 441 questionnaires mailed. A follow-up letter was mailed to all nonrespondent banks reminding them to return the questionnaire. Eighteen additional questionnaires were returned following this letter.

Bank Characteristics

The 72 counties represented by the 117 responding banks were dispersed evenly across Kansas and the Kansas Banker's Association (KBA) Banking Districts. Total assets for the 117 responding banks averaged $46.9 million and ranged from $3.9 to $225.9 million; the standard deviation was $40.0 million. Twenty-eight percent of the banks had total assets of $20 million or less; 55.6% had total assets between $20 million and $80 million; and 16.2% had total assets of greater than $80 million. The mean capital/assets ratio was 10.6%.

The mean loan/deposit ratio was 61.7% and ranged from 18.0% to 99.8%. The mean return on assets was 1.4% but ranged from 0.3% to 14.5%.

State chartered banks outnumbered national banks by nearly two-to-one. Fifty-one banks had more than one banking location, whereas 64 banks were unit banks. Ninety-three banks were owned by holding companies. The mean number of years of experience for a chief executive officer was 11. Thirty-three of the respondents had 5 or fewer years of experience, whereas another 38 respondents had 6 to 10 years of experience.

The average overall health of responding banks was 1.34, on a scale of 1 to 5 with 1 being excellent health and 5 classified as a bank subject to closure. Seventy-two responding banks considered themselves to be in excellent health, whereas the other 37 banks considered themselves to be in very good health. No banks reported a rating higher than 2.

Results of individual CAMEL (Capital Asset Management Earnings Liquidity) rating component relative strength questions indicated Kansas banks tend to consider management ability and capital adequacy their strongest components on average. Asset quality and earnings were given poorer ratings, and bank liquidity was considered to be the relative weakest of the five components.

Identifying Risk

Credit risk was perceived as the most important financial risk, receiving a mean ranking of 1.51. For survey purposes, credit risk was defined as potential delinquency or default by borrowers. Seventy-seven of the 108 responding banks ranked credit risk as having the greatest impact on bank decision making. Cost of funds risk was considered the second most important financial risk, with a mean ranking of 2.94. This risk was defined as

unanticipated changes in the cost of funds. Although the differences were not large, regulatory risk, liquidity risk, and investment risk ranked third, fourth, and fifth, with mean rankings of 3.57, 3.71, and 3.90, respectively. Solvency risk was considered the least important of the six financial risks with seventy banks ranking solvency risk last, giving it a mean ranking of 5.59. The rankings of risks in 1995 are consistent with Vandeveer's 1985 survey of risk management in Kansas banks.

In addition to ranking the six primary financial risks, banks were asked to rate the factors contributing to their financial risk rankings. Roughly 63% and 68% of banks considered the state of the farm economy and the quality of personnel as the most important risk factors contributing to their financial risk rankings, respectively. Volatile interest rates, the state of the general economy, the changing structure of banking laws, and the activities of competitors were considered relatively less important to the risk position of the banks. The greatest percentage of respondents classified these elements as important, though not critical, factors. Since Vandeveer's 1985 survey, personnel quality, the volatility of interest rates, and competitor's activities have increased in importance while the general economy and the changing structure of banking laws have decreased in importance.

Risk Responses

Banks' responses to risk focused on loan participation, diversification, interest rate changes, and gap analysis. Seventy-four out of 112 responding banks indicated using loan participation for risk management. However, only 25 of these banks had participations exceeding 5.0% of their total loan volumes. Loan participations averaged 3.99% of total loan volumes. Forty-five banks had participations in a portion of their agricultural loans.

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Diversification is another fundamental risk management technique. Nearly 60.2% of banks indicated that they could further diversify and reach broader markets by providing additional types of loans, whereas 55.9% of banks said that they could attract additional types of depositors to further diversify liabilities. Many banks diversify by seeking loans outside their normal geographical market. Survey results indicated this to be a prominent practice of Kansas banks; 85.5% of banks possessed some loans outside their geographical market. Loans outside the normal market area averaged 7.39% of total loan volume.

Banks indicated several intervals for repricing interest rates on certificates of deposit (CD's). The most common response was weekly changes. Twenty-three banks responded that they change their rates when competitors' rates change, possibly indicating the existence of price leaders in the Kansas banking industry.

Gap analysis measures the difference in timing of the repricing of assets and liabilities within a specified time. Banks can use gap to measure interest rate risk and the instability of net interest margins. Eighty-two banks responded that they calculated 3-month gaps; 69 banks calculated 6-month gaps; and 89 banks calculated 12-month gaps. Among those banks that calculated gaps, 82.9% of the 3-month gaps were positive; 82.6% of the 6-month gaps were positive; and 86.5% of the 12-month gaps were positive. Thus, most Kansas banks are protected from interest rate increases. The largest percentage of gap ratios fell between zero and 1.0 for all gap horizons.

The margin between interest on assets and interest on liabilities is a major concern related to interest rate risk for financial institutions. Interest rate spreads measure the difference between the weighted average return on interest-earning assets and the weighted

average cost of funds. The average interest rate spread for Kansas banks was 4.10%. Over

85% of banks had spreads between 4% and 5%.

Asset/Liability Management

The importance of ALM was readily apparent in Kansas banks; only six banks

reported having no formal ALM policy. Policies most frequently contained provisions for

formal objectives, limits on interest rate risk exposure, and philosophies. Over 73% of banks

had policies containing strategies and delegations of authority. Nearly two-thirds of all banks

also had reporting and decision making processes as sections of their ALM policies.

Asset/liability management committees existed in 103 responding banks, and most met on a

monthly basis. Quarterly and weekly meetings were the next most common time intervals. In

nearly two-thirds of responding banks, the major functions of ALM committees were loan

pricing, funding, interest-rate risk measurement and management, competition assessments,

and liquidity requirement management. Additional functions listed by bankers included

managing spreads, earnings and capital, reviewing strategies and performance, supervising

management, and controlling and reviewing security transactions and portfolios.

Fifty-four banks used differential or tier-based loan-pricing systems, whereas 56 banks

reported that they did not use such systems. Of the 54 banks using differential pricing, over

85% used chattel margin, owner's equity, and repayment capacity as factors for determining

tier status. Other factors mentioned by bankers included collateral type, deposit

balances/liquidity, and management and history of the borrower.

Bank loans generally fall into three categories: variable rate loans, adjustable rate

loans, and fixed rate loans. Average total loans for responding banks were 29% variable rate,

14% adjustable rate, and 57% fixed rate. The largest number of banks reported bimodal variable-rate loan portfolio values of 0 to 5% and greater than 25%; adjustable rate loans made up 5% or less of the loan portfolio; and fixed rate loans comprised greater than 50% of total loan portfolios.

Various techniques exist for risk measurement and management in commercial banks. Results indicate the most common technique in Kansas banks is gap analysis. It was employed in over twice as many banks as the next closest technique, duration analysis. Simulation models were used in only 24.1% of banks, and derivative products were practically unused in Kansas banks (Table 1).

Techniques used for liability management included match-funded lending programs, callable bonds, floating rate bonds, and debt buybacks. These techniques were used in less than 42% of Kansas banks. Match funding was the most commonly used technique; however, only 48 Kansas banks indicated its use (Table 2).

Strict asset management techniques received relatively greater use in Kansas banks (Table 3). Loan product pricing was used in 104 of 116 banks, whereas investments were used in 101 banks. The least used asset management technique, loan sales and participations, was reported by nearly 44% of banks.

Although increasing in popularity on a national basis, off-balance sheet products were almost never used in Kansas banks. Off-balance sheet products, also referred to as derivative products, include swaps, financial futures, options contracts, forward rate agreements and swaptions. Only one of 116 responding banks indicated use of any of these products and used only option contracts.

Specialized computer software for asset/liability management was used in more than one-half of responding Kansas banks. Sixty-seven banks indicated that they use a specialized ALM computer program. Further, several banks indicated that they used more than one computer model. In total, 22 different ALM models or specialized programs were reported. Of the 47 banks listing programs, 34 indicated that ALM models were purchased from a retailer; 2 indicated that the models were designed in-house; and 11 did not respond as to the origin of the model. Of the 11 banks not indicating model origin, 6 of the models were indicated as a retail purchase by other respondent banks, whereas the other 5 programs appeared to be consulting or correspondent services, which also can be considered a type of retail purchase. In total, 37 banks indicated that computer programs were retail purchases, and 17 banks indicated that programs were designed in-house.

Several relationships among bank activities and ALM were examined. The relationships of the use of ALM software with total asset volume, KBA district, return on assets, CEO experience, total agricultural loan volume, and bank type (agricultural or non-agricultural) were of interest. Tables 4 and 5 report the number of banks using ALM software in various categories of each of these areas. Ordinary least squares regression results indicated no significant relationship between the use of asset/liability management software and total asset volume, return on assets, KBA district, or total agricultural loan volume. A positive relationship between CEO years of experience and the use of ALM software was found suggesting that the longer a CEO has held that position, the more likely a bank was to use ALM software. Table 6 reports regression results and Pearson correlation coefficients. Pearson correlation coefficients also indicated very little correlation between

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total assets, return on assets, KBA district, total agricultural loans, and bank type with the use of ALM software. CEO experience exhibited the strongest correlation with ALM software use, however, the relationship was still a weak one. The results also indicated a very weak negative relationship between the use of ALM software and return on assets, KBA district, and total agricultural loans. Although these relationships are weak, they suggest that as return on assets and agricultural loan volumes increase, the use of ALM software decreases. KBA results weakly imply that as you move from east to west across Kansas, the use of ALM software decreases.

The relationships of total asset volume, KBA district, return on assets, CEO experience, total agricultural loan volume, and bank type (agricultural or non-agricultural) with the use of a specific ALM model were also examined. Results indicated very weak or no clear relationship between any of these variables and the use of any specific ALM model.

SUMMARY

Asset/liability management tools are important to a bank's earnings, liquidity, capital structure, and risk management. Numerous ALM models and techniques are available to financial institutions. Several factors must be considered before choosing an appropriate strategy.

This paper has presented the results of a survey of Kansas' bankers analysis of risk and ALM. One hundred seventeen of the 441 banks surveyed responded to the questionnaire mailed in the fall of 1995, for a response rate of 26.5%. Information was collected regarding bank characteristics, risk perceptions, risk management practices, and ALM practices in Kansas banks.

Survey results show credit risk to be the predominant risk concern of Kansas bankers, with cost of funds risk being the second most important. These rankings have not changed since 1985. The farm economy and personnel quality are the most important factors contributing to these banking risks. Since 1985, the volatility of interest rates, personnel quality, and competitor's activities have increased in importance as risk contributing factors, highlighting the increased importance and awareness of ALM during the last decade. Banks currently perceive themselves to be in overall excellent financial condition.

Asset/liability management practices vary throughout the state. Nearly 95% of all banks have formal ALM policies, and nearly 90% have ALM committees to oversee various ALM activities. Gap analysis, loan product pricing, and diversification are the major risk-management techniques used in Kansas banks. Derivative products seldom are used by Kansas banks. Specialized ALM computer software is popular in Kansas banks. Little to no relationship appears to exist between ALM software use and total asset volume, KBA district, return on assets, CEO experience, or total agricultural loan volume.

Table 1. Techniques Used for Risk Measurement and Management

Technique	Number of Banks
Gap Analysis	107
Duration Analysis	50
Simulation	28
Swaps	3
Hedging with Financial Futures	0
Hedging with Options	0
Swaptions	0
Total Responding Banks	116

Table 2. Techniques Used for Liability Management

Technique	Number of Banks
Match Funded Lending Programs	48
Callable Bonds	42
Floating Rate Bonds	35
Debt Buybacks	3
Total Responding Banks	116

Table 3. Techniques Used for Asset Management

Technique	Number of Banks
Loan Product Pricing and Marketing	104
Fees and Penalties	61
Investments	101
Loan Sales andParticipations	51
Total Responding Banks	116

Table 4. Use of Asset/Liability Management Computer Software by Total Assets and Bank Type

	< $20 M	$20 - $50 M	$50 - $80 M	> $80 M	Total
Number of Banks	33	51	14	19	117
Number of Banks Using a Model	15	36	8	8	67
Number of Agricultural Banks	27	31	7	10	75
Number of Agricultural Banks Using a Model	12	21	2	5	40
Number of Non-Agricultural Banks	6	20	7	9	42
Number of Non-Agricultural Banks Using a Model	3	15	6	3	27

Table 5. Use of Computer Software for ALM by Return on Assets, KBA District, and C.E.O. Experience

	Return on Assets						
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	< 1.0	1.0 - 2.0	> 2.0	Total			
Number of Banks	48	60	4	112			
Number of Banks Using a Model	32	33	2	67			

	KBA District						
	One	Two	Three	Four	Five	Six	Total
Number of Banks	14	17	20	21	19	25	116
Number of Banks Using a Model	11	9	8	12	13	14	67

	C.E.O. Experience						
	< 3 Yrs	3 - 5 Yrs	5 - 10 Yrs	10 - 15 Yrs	15 - 20 Yrs	> 20 Yrs	Total
Number of Banks	20	13	38	17	14	13	115
Number of Banks Using a Model	16	3	19	9	9	11	67

Table 6. Regression and Correlation Estimates for ALM Model Use

Independent Variable	Intercept	Parameter Estimate	R-Square	RMSE	Correlation Coefficient
Total Assets	0.5906	4.1100E-11	0.0000	0.4960	0.0234
	(0.07423)[1]	(1.1174E-9)			
Return on Assets	0.6173	-0.0175	0.0041	0.4950	-0.0634
	(0.0606)	(0.02662)			
KBA District	0.5972	-0.0012	0.0000	0.4960	-0.0236
	(0.1175)	(0.0283)			
C.E.O. Experience*	0.4621	0.0123*	0.0375	0.4866	0.2067
	(0.0794)	(0.006)			
Total Ag Loans	0.6647	-0.0019	0.0104	0.4934	-0.1120
	(0.0833)	(0.0018)			
Agricultural Banks					-0.0424
Non-Ag Bank					-0.1558

[1]Standard errors are in parentheses.
*Denotes significant coefficients at the 5% level.

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